Section 3.8
NOISE

This section presents an evaluation of potential noise resulting from the construction and operation of the Wild Horse Wind Power Project (WHWPP). An essential part of this assessment is a comparison of expected noise levels from the project with acceptable noise levels presented in applicable regulations and industry environmental guidelines. Information presented in this section was derived mainly from the Application of Site Certification (ASC, Section 3.8 and Exhibit 15-B).

The effects of environmental noise on people fall into three general categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with such activities as speech, sleep, and learning; and
- Physiological effects such as startling and hearing loss.

In most cases, environmental noise produces effects in the first category only. However, residents close to roads and industrial facilities, and workers in industrial plants, may experience noise effects in the second and third category.

3.8.1 Affected Environment

3.8.1.1 Fundamentals of Acoustics

Airborne sound is a rapid fluctuation of air pressure caused by mechanical vibrations. Noise is defined as unwanted sound. There are several ways to measure noise, depending on the source of the noise, the receiver, and the reason for the noise measurement. Table 3.8-1 describes the acoustical terms used in this section.

Table 3.8-1 Definitions of Acoustical Terms

Term	Definition
Ambient noise level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intruding noise	Noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.

Term	Definition
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the base 10 logarithm of the ratio of the reference pressure to the sound pressure, which is 20 micropascals.
Decibel A-weighted sound level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted unless stated otherwise.
Equivalent noise level (L_{eq})	The energy average A-weighted noise level during the measurement period.
Percentile noise level (L_n)	The A-weighted noise level exceeded during n% of the measurement period. For example, L10 is a relatively loud noise exceeded only 10% of the time, while L90 is a relatively quiet sound exceeded 90% of the time.

Table 3.8-2 presents a range of noise levels generated by typical residential and commercial activities.

Table 3.8-2. Sound Pressure Levels of Representative Sounds and Noises

Source	Decibels	Description
Jet takeoff (nearby)	150	
Pneumatic riveter	130	
Jet takeoff (60 meters)	120	Pain threshold
Construction noise (3 meters)	110	
Subway train	100	
Heavy truck (15 meters)	90	Constant exposure endangers hearing
Average factory	80	
Busy traffic	70	
Normal conversation (1 meter)	60	
Quiet office	50	Quiet
Library	40	
Soft whisper (5 meters)	30	Very quiet
Rustling leaves	20	
Normal breathing	10	Barely audible
Hearing threshold	0	

Source: Beranek 1988

The dBA scale is logarithmic. Therefore, individual dBA ratings for different sources cannot be added directly to calculate the sound level for combined sources. For example, two sources, each producing 50 dBA will, when added logarithmically, produce a combined noise level of 53 dBA.

With regard to increases in A-weighted noise level, knowledge of the following relationships is helpful in understanding this section (Kryter 1970):

- Noise increases of less than 1 dBA can be easily discernible (and possibly annoying) when the new intruding noise is markedly different in character from the original baseline noise (e.g., backup beepers in an otherwise quiet neighborhood).
- Under normal listening conditions, a 3-dBA change is considered a just-perceivable difference when the new intruding noise is of a similar character to the baseline noise.
- A change in level of at least 5 dBA is required before any noticeable change in community response can be expected when the new intruding noise is of a similar character to the baseline noise.
- A 10-dBA change is subjectively heard as approximately a doubling in loudness and would likely cause an adverse response.

3.8.1.2 Noise Standards and Environmental Impact Thresholds

Washington State Noise Limits

Section 173-60 of the Washington Administrative Code (WAC) provides the applicable noise standards for Washington state, including Kittitas County (County). The County has not promulgated independent state-approved noise standards pursuant to WAC 173-60-110. WAC 173-60 establishes maximum permissible environmental noise levels. These levels are based on the environmental designation for noise abatement (EDNA) that is defined as "an area or zone (environment) within which maximum permissible noise levels are established." There are three EDNA designations (WAC 173-60-030), which roughly correspond to residential, commercial/recreational, and industrial/agricultural uses:

- Class A: Lands where people reside and sleep (such as homes),
- Class B: Lands requiring protection against noise interference with speech (such as commercial/recreational), and
- Class C: Non-residential lands where economic activities are of such a nature that higher noise levels are anticipated (such as agricultural).

As used in this section, all existing homes near the project site are noise-sensitive areas, which are equivalent to Class A EDNA areas. Table 3.8-3 summarizes the maximum permissible levels applicable to noise originating from an industrial site (e.g., the proposed wind turbine generators [WTGs]) as received at homes (Class A EDNA) and at agricultural areas (Class C EDNA)

Table 3.8-3. State of Washington Noise Regulations (WAC 173-60-040)

	Maximum Permissible Noise Levels (dBA) from a Class C EDNA		
	Class A EDNA Receiver		Class C EDNA Receiver [1]
Statistical Descriptor	Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)	Anytime
L_{eq}	60	50	70
L_{25}	65	55	75

	Maximum Permissible Noise Levels (dBA) from a Class C EDNA		
	Class A EDNA Receiver		Class C EDNA Receiver [1]
Statistical Descriptor	Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)	Anytime
$L_{16.7}$	70	60	80
$L_{2.5}$	75	65	85

[1] Standard applies at the property line of the receiving property.

Source: WAC 173-60

The following are exempted from the limits presented in Table 3.8-3 (per WAC 173-60-050):

- Construction noise (including blasting) between the hours of 7 a.m. and 10 p.m.;
- Motor vehicles operated on public highways);
- Motor vehicles operated off public highways, except when such noise affects residential receivers; and
- Noise from electrical substations is exempted from the nighttime limits (WAC 173-60-050[2][a]).

Environmental Impact Thresholds for Noise Increases Above Background

The noise limits listed in Table 3.8-2 are legal limits that cannot be exceeded without obtaining a variance from state regulations. However, it is well understood that new intruding noise from industrial facilities can be readily discernible and annoying (and therefore cause an environmental impact) even when the noise levels are below the legal limits.

The wind energy industry recognizes that the noise generated by WTGs (consisting of the "swishing sound" of the blades and mechanical noise from the electrical generators inside the nacelle) can cause a significant impact if the WTGs are installed near homes in areas with low background noise. The British Wind Energy Association recommends that the noise levels resulting from new wind generation facilities should be kept within 5 dBA of the average evening and nighttime background levels at homes (British Wind Energy Association 2003). That recommended restriction of 5 dBA above background has been used as the environmental impact significance criterion for this noise analysis.

Traffic Noise Impact Criterion

Traffic noise caused by haul trucks and commute vehicles traveling at low speed through the town of Kittitas were estimated using the Federal Highway Administration (FHWA) TNM Lookup model. The estimated peak-hour traffic noise levels were compared to FHWA's Noise Abatement Criteria (FHWA 1995). In accordance with noise assessment guidelines published by the Washington State Department of Transportation (2004) a traffic noise impact is defined as a peak-hour traffic level exceeding 66 dBA at any residence.

3.8.1.3 Noise-Sensitive Receivers and Background Noise Conditions

Figure 3.8-1 shows the locations of homes nearest the site. The project would be located in a rural area with a low population density. Most of the project site would be located on large tracts of privately owned land with no homes. The proposed Puget Sound Energy interconnect substation also lies on privately owned land. The applicant has obtained an option to purchase the private land within the project site boundary from the landowner and has executed a lease with the Washington Department of Natural Resources for wind power on the project site.

Baseline noise measurements were not conducted by the applicant. For this assessment, the baseline noise levels were estimated based on noise measurements the applicant conducted in similar geographic areas of the County as part of the its application for the Kittitas Valley wind energy project (EFSEC 2004). The closest distance between a residence and a wind turbine is nearly 2 miles, as shown on Figure 3.8-2. The nearest homes consist of two general clusters:

- Four homes south of the project along Vantage Highway, roughly 2 to 3 miles from the nearest WTG. Background noise at those homes is likely affected by traffic along the highway. The estimated average nighttime background noise levels at these homes is 40 to 50 dBA based on measurements taken by the applicant at homes along U.S. 97 west of Ellensburg (EFSEC 2004).
- Six homes northwest of the project site (roughly 2 to 3 miles from the nearest WTG). These homes are far from any major highways, so the baseline noise levels are likely lower than those at homes along the Vantage Highway. The estimated average nighttime background noise levels at these homes is 30 to 35 dBA based on measurements taken by the applicant at isolated rural homes west of Ellensburg (EFSEC 2004).

3.8.1.4 Kittitas Valley Alternative

Noise-sensitive areas in the project vicinity include Class A and Class C EDNA. The study area for project-related noise impact analysis included all areas where residents have the potential to hear construction or operational noise from the project. There are approximately 60 residential structures within 1 mile of the proposed wind turbine strings. The primary source of existing noise in the project area is wind and vehicular traffic on U.S. 97.

3.8.1.5 Desert Claim Alternative

Noise-sensitive areas in the project vicinity include Class A and Class C EDNA. The predominant sources of existing noise on and near the project site include agricultural activities, traffic on local roadways, and occasional overhead aircraft (including helicopters).. At some locations, wind at higher speeds is also a major source of noise.

3.8.1.6 Springwood Ranch Alternative

Existing sound levels in the vicinity of the project site for Springwood Ranch have not been measured. However, given the existing low-density land uses in the area, it is likely that the predominant sound source in the southern portion of the site is Interstate 90, and that farther from the freeway the sound levels are relatively low. Operation of agricultural equipment on the

ranch and in nearby areas likely creates intermittent, localized noise. Potentially sensitive receivers for this alternative include scattered developed sites near Taneum Creek to the south of the site; nearby residences to the east along the Thorp Highway and school and residential uses within the nearby community of Thorp; and the Sunlight Waters residential/recreational community near the northwest corner of the site. The potential receivers in Thorp and Sunlight Waters would be classified as Class A EDNAs, while those in the rural areas would be classified as Class C EDNAs.

3.8.1.7 Swauk Valley Ranch Alternative

Noise-sensitive areas in the project vicinity include Class A and Class C EDNA. The study area for project-related noise impact analysis included all areas where residents have the potential to hear construction or operational noise from the project. There are an estimated 60 residential structures within 1 mile of the proposed wind turbine strings, mostly downslope along the Yakima River and south of the project site. The primary source of existing noise in the project area is wind and vehicular traffic on SR-10.

3.8.2 Impacts of Proposed Action

This section evaluates potential noise impacts that could result from construction and operation of the proposed project. Direct impacts would occur if noise levels exceed the regulatory limits or the environmental impact thresholds described in Section 3.8.1.2. Indirect impacts are not anticipated because the project is not expected to substantially induce regional growth to the extent that would result in significant changes to offsite noise. The proposed project would comply with all regulations and environmental noise criteria during construction and operation. Table 3.8-4 summarizes potential noise impacts under the three project scenarios.

Table 3.8-4. Summary of Potential Noise Impacts

	104 Turbines /3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines /1.0 MW
Construction Impacts			
Noise generated by construction equipment.	Same as Most Likely Scenario.	No impact. Nearest home is more than 2 miles away from the closest WTG.	Same as Most Likely Scenario.
Blasting noise/conflicts with nearby residential/land use.	Same as Most Likely Scenario.	No impact. Blasting would be done only during daytime, and the nearest home is more than 3 miles away from the closest rock quarry.	Same as Most Likely Scenario.
Noise generated by construction traffic in town of Kittitas.	Same as Most Likely Scenario.	Unlikely to cause any adverse impact. Commute vehicles and up to 49 heavy trucks per hour would cause traffic noise levels to exceed FHWA impact thresholds only at homes within 60 feet of the street centerline.	Same as Most Likely Scenario.
Operations and Maintenance Impacts			
Noise generated by wind turbines.	Same as Most Likely Scenario.	No impact. Operational noise levels would be less than	Same as Most Likely Scenario.

	104 Turbines /3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines /1.0 MW
turbines.	Scenario.	background at the nearest homes.	Scenario.
Noise generated by high-voltage transmission lines.	Same as Most Likely Scenario.	No impact. Noise levels would be less than Washington state limits at all points outside the transmission line right-of-way.	Same as Most Likely Scenario.
Noise generated by traffic.	Same as Most Likely Scenario.	No impact. Commute traffic would consist of only 36 trips a day, or 18 trips during the peak hour.	Same as Most Likely Scenario.
Vibration effects.	Same as Most Likely Scenario.	No impact. Nearest home is 2 miles from the nearest WTG.	Same as Most Likely Scenario.
Decommissioning Impacts			
Construction trucks along streets in town of Kittitas.	Same as Most Likely Scenario.	Unlikely to cause any adverse impact. Similar in magnitude but shorter in duration compared to those anticipated for the construction phase.	Same as Most Likely Scenario.

3.8.2.1 Construction Impacts

Installation of WTGs and Support Facilities at Remote Project Site

Noise generated by construction of the WTGs within the remote project site would not cause any significant impacts at the nearest homes. The intensity of construction activity is expected to vary, depending on the construction phase. Table 3.8-5 lists the typical noise levels associated with common construction equipment at various distances. The estimated noise level caused by the loudest equipment is expected to be well below the normal daytime background level at the nearest home 2 miles from the closest WTG.

All noise-generating construction activities would be conducted between the hours of 7 a.m. and 10 p.m. and are therefore exempt from the limits presented in Table 3.8-3 (per WAC 173-60-050). Blasting is anticipated for the WTG foundations and potentially some road areas. Blasting would be conducted only during daylight hours and is anticipated to occur over a period of 8 weeks. Blasting activities are specifically exempt from the noise regulations (per WAC 173-60-050 [1][c]).

Table 3.8-5. Noise Levels from Common Construction Equipment at Various Distances (dBA)

Construction Equipment	Typical Sound Pressure Level at 50 Feet	Expected Sound Pressure Level (dBA) at Specified Distance		
		1,000 feet	5,000 feet	10,000 feet
Bulldozer (250 to 700 horsepower)	88	62	48	42
Front-end loader (6 to 15 cubic yards)	88	62	48	42
Truck (200 to 400 horsepower)	86	60	46	40
Grader (13- to 16-foot blade)	85	59	45	39

Construction Equipment	Typical Sound Pressure Level at 50 Feet	Expected Sound Pressure Level (dBA) at Specified Distance		
		1,000 feet	5,000 feet	10,000 feet
Shovel (2 to 5 cubic yards)	84	58	44	38
Portable generators (50 to 200 kilowatts)	84	58	44	38
Mobile crane (11 to 20 tons)	83	57	43	37
Concrete pumps (30 to 150 cubic yards)	81	55	41	35
Tractor (3/4 to 2 cubic yards)	80	54	40	34

Note: Estimated levels include attenuation due to distance only (geometric spreading). Atmospheric effects (molecular absorption) would reduce levels.

Source: Barnes et al. 1977

Construction Traffic Noise

Construction vehicles traveling at low speed through the town of Kittitas would not cause noise levels at nearby homes to exceed FHWA's 66-dBA impact criterion. As many as 49 heavy haul trucks per hour and 170 commute vehicles per hour would travel through town during the peak hour of the major construction period. FHWA's TNM Lookup Model was used to estimate the traffic noise levels generated along city streets. Assuming the construction trucks and cars traveled at 25 miles per hour (mph), the estimated traffic noise levels are listed in Table 3.8-6.

Table 3.8-6. Peak-Hour Traffic Noise Levels During Construction

Distance from Street Centerline (feet)	Peak-Hour Traffic Noise Level (dBA): 49 trucks/hour and 170 commute cars/hour
60	66
100	64
15/0	62

For the estimated peak-hour traffic volumes, the noise levels would exceed FHWA's noise impact criterion (66 dBA) only at homes within 50 feet of the street centerline. However, there are few, if any, homes that close to the road. Thus, it is concluded there is little potential for construction vehicles to adversely impact homes in the town of Kittitas

3.8.2.2 Operation and Maintenance Impacts

WTG Noise Modeling Methodology

The procedures for determining sound power levels from wind turbines are defined in International Electrotechnical Commission (IEC) 61400 Wind Turbine Generator Systems Part 11: Acoustic Noise Measurement Techniques (Reference Number: IEC 61400-11:1998[E]). The measurement technique outlines procedures to determine corrections for background noise, apparent sound power level, and wind speed dependence. Although the exact turbine model to

be used for the project has not yet been determined, conservative values for the type of equipment being considered have been used for the noise analysis. The turbines are expected to be warranted by the manufacturer to not exceed a maximum sound power level of 110 dBA during a wind speed of 18 mph at nacelle height. This is equivalent to a sound pressure level of 78 dBA at 50 feet from the turbine. Measurements conducted by others at existing wind power projects suggest that actual noise levels are several dBA lower than manufacturer-guaranteed values.

A three-dimensional noise model was developed using CADNA/A, a program developed by DataKustik, GmbH, in Munich, Germany. The algorithms in CADNA/A are based on the International Standard ISO–9613-2, "Attenuation of Sound During Propagation Outdoors." Octave band sound power levels (determined in accordance with IEC 61400) for the wind turbines and topographic information from the U.S. Geological Survey were input into the model.

Estimated Noise Levels from WTGs

At the nearest homes surrounding the project, estimated ground-level noise levels caused by operation of the combined WTGs at their rated noise emissions are shown in Figure 3.8-1. As listed below in Table 3.8-7, the modeled WTG noise levels at each house are less than the estimated average evening background levels. Therefore, it is concluded the operational WTG noise would not be discernible at the nearest homes.

Table 3.8-7. Modeled WTG Noise Levels at Residences

	WTG Noise	Evening Background
Four homes along Vantage Highway	30 to 35 dBA	40 to 50 dBA
Six homes northwest of the site	25 to 30 dBA	30 to 35 dBA

Noise from Transmission Lines and Substations

Audible noise from the high-voltage transmission feeder line(s) would comply with the level specified in WAC 173-60-040. Noise associated with operation of proposed high-voltage transmission lines would be corona noise during infrequent wet or foggy weather. Corona noise is a low-frequency hum (120 hertz) and crackling caused by partial breakdown of the insulating properties of air surrounding the electric conductor of the transmission line (Bonneville Power Administration and EFSEC 2002). The high-voltage transmission lines associated with the project would connect the proposed substations to existing high-voltage overhead transmission lines. Audible noise from the transmission lines would comply with the Bonneville Power Administration's limits, namely an L_{50} level of 50 dBA at the edge of the right-of-way. There are no existing dwellings within the right-of-way of the transmission lines; therefore, corona noise would comply with Washington state noise limits at the nearest homes.

Substation transformers and high-voltage switching equipment would be specified and constructed to comply with the allowable noise limits specified in WAC 173-60-040 (see Table 3.8-3), namely the 70 dBA limit at all Class C EDNA (agricultural) property lines and

60 dBA at all residences. All of the substation locations are far from any homes, so compliance with this performance specification would be straightforward.

Noise from Operational Traffic

Operational traffic noise would be much lower than noise levels during construction. Operational traffic would generally consist of only 36 commute trips per day (18 trips per peak hour) plus a small number of delivery trucks. Operational traffic noise is not expected to exceed FHWA's impact criterion even at homes closest to the street.

Comparison of Impacts of Proposed Scenarios

Construction noise levels would be the same, regardless of the type of turbine used for the project. All of the noise analysis and study work was performed for a turbine source noise level of 110 dBA, which is higher than the guaranteed noise level of all turbine scenarios under consideration and evaluation for the project. State of Washington Noise Regulations would be observed in all cases.

3.8.2.3 Decommissioning Impacts

Decommissioning activities at the project site would result in less noise than those for construction, as little or no blasting would be necessary and heavy equipment would be used for a shorter period. Noise-generating decommissioning activities would be conducted between 7 a.m. and 10 p.m. The same mitigation measures recommended during construction (Section 3.8.4) could also be used during the decommissioning phase.

Traffic noise caused by heavy haul trucks traveling through the town of Vantage might occasionally exceed FHWA's traffic noise impact criterion at the homes along the streets.

3.8.3 Impacts of Alternatives

3.8.3.1 Impacts of Off-Site Alternatives

Kittitas Valley Alternative

Noise generated by construction equipment is expected to vary, depending on the construction phase, but would not be expected to substantially impair nearby residential land uses. Temporary blasting noise impacts would be associated with construction of the wind turbines. Construction vehicles traveling on local roadways and other nearby roads would temporarily increase noise levels.

Modeling of a major wind power generation facility at this site comparable to the WHWPP indicated the potential for significant noise impacts (EFSEC, 2004). Noise levels during project operations could exceed regulatory limits at several homes nearest the WTG strings. Changes in background noise levels at numerous other homes could be perceived as adverse depending on the magnitude of that change and the nature of the receptor. Minor increases in traffic along U.S. 97 and project access roads during project operations would not be expected to generate

substantial adverse noise effects. The project would not result in any significant impacts from groundborne vibration.

Desert Claim Alternative

During construction, there would be temporary increases in sound levels near active areas of construction and along roadways used for construction vehicles, depending on the type of equipment being used and the amount of time it is in use.

Predicted operational noise levels at all receptor locations would meet applicable noise limits. Based on Noise level and/or increase over ambient levels, project noise impacts would be rated either low or medium, and would not be significant.

Springwood Ranch Alternative

Several residences are within approximately 500 feet of one or two turbine locations in the northwestern corner of the Springwood Ranch layout. Construction impacts at the closest homes would include temporary increases in sound levels near active areas of construction and along roadways. The closest residences could be subject to operational noise in excess of the 50-dBA limit, and/or noise level increases of about 10 dBA. It is possible that the proposed project might result in significant noise impacts to these residences unless the turbines in question were relocated or eliminated.

Swauk Valley Ranch Alternative

Noise generated by construction equipment is expected to vary, depending on the construction phase, but would not be expected to substantially impair nearby residential land uses. Temporary blasting noise impacts would be associated with construction of the wind turbines. Construction vehicles traveling on local roadways and other nearby roads would temporarily increase noise levels.

Noise levels during project operations could exceed regulatory thresholds. Changes in background noise levels could be perceived as adverse depending on the magnitude of that change and the nature of the receptor. Minor increases in traffic along U.S. 97 and project access roads during project operations would not be expected to generate substantial adverse noise effects. The project would not result in any significant impacts from groundborne vibration.

3.8.3.2 Impacts of No Action Alternative

The No Action Alternative assumes that future development at the site would comply with existing zoning requirements for the project area, which is zoned Commercial Agriculture and Forest and Range. According to the County's zoning code, the Commercial Agriculture zone is dominated by farming, ranching, and rural lifestyles, and permitted uses include residential, green houses, and agricultural practices. Permitted uses in the Forest and Range zone include logging, mining, quarrying, and agricultural practices, as well as residential uses. Agricultural activity and low-density housing would generate no significant noise impacts at residences. Any proposed mining or quarrying activity would be subject to noise restrictions under Chapter 173-60 WAC, Maximum Environmental Noise Levels.

If the project is not constructed, the region's need for power would be addressed by developing other generation sources. The construction and operation of a base load gas-fired combustion turbine would create more noise than the proposed wind generation project. The noise impacts of a gas turbine generator would depend on its proximity to homes. Development of renewable energy facilities could result in similar noise levels of the WHWPP, the impacts depending on the proximity to homes.

Noise from the decommissioning of other energy facilities would depend on the extent of the facilities being removed.

3.8.4 Mitigation Measures

Although no specific receivers are identified as being impacted by construction noise at the remote project site, and the Applicant has not proposed any mitigation measures associated with noise impacts, the following contractor practices are recommended to minimize the effects of construction noise in the project area:

- Implement work-hour controls so that noisy activities occur between 7 a.m. and 10 p.m., which would reduce the impact during sensitive nighttime hours.
- Do not allow heavy-duty haul trucks to travel through the town of Kittitas during evening or nighttime hours.
- Do not allow haul trucks to park and idle within 100 feet of a residential dwelling.
- Conduct blasting only during daylight hours.
- Maintain equipment in good working order and use adequate mufflers and engine enclosures to reduce equipment noise during operation.
- Coordinate construction vehicle travel to reduce the number of passes by sensitive receivers.

3.8.5 Significant Unavoidable Adverse Impacts

Haul truck traffic during construction would cause high noise levels at homes near the roads being used to access the site. Peak-hour traffic noise would likely exceed FHWA's noise impact criteria at homes within 75 to 150 feet of the haul route. Although temporary in nature, these traffic noise levels would be adverse and unavoidable.